NCI: VIDEO JOURNEY INTO NANOTECHNOLOGY

Imagine….Something 80,000 times smaller than the breadth of the ridge on a fingertip unlocking a new frontier into cancer research. Nanotechnology, the science of building small, is changing the way we look at cancer…more importantly the way we look at diagnosis and treatment.

Nanotechnology allows researchers to build new tools that are actually smaller than cells, giving them the opportunity to attack cancer cells at the cellular and genetic level. This technology not only enables health practitioners to detect cancer earlier but also holds the promise of stopping cancer before it even develops.

This revolutionary approach is so precise, doctors will be able to design a unique treatment for an individual's own medical and genetic profile.

Based on computer chip technology, diagnostic devices such as nanoarrays are thousands of times more sensitive and accurate than current techniques. Because of their size, multiple lab tests can be done more rapidly and at a much lower cost using one nanodevice instead of many.

Nanoshells can be linked to antibodies that recognize tumor cells. Once they are taken up by the cancer cells, near-infrared light is applied, killing only the tumor and leaving neighboring, healthy cells intact.

Scientists are engineering nanoparticles such as dendrimers to seek out and destroy cancer cells. This amazing technology can be customized for targeted drug delivery, improved imaging, and near real-time confirmation of cancer cell death.

Moving research from bench to bedside is an important goal of the National Cancer Institute's Alliance for Nanotechnology in Cancer. A collaborative plan is underway to share research and development information across scientific disciplines and around the world.

As biomedical applications of nanotechnology evolve, scientists are ensuring that nanodevices are safe for both the body and the environment. The National Cancer Institute is optimistic that through coordinated and responsible development, nanotechnology will dramatically change cancer patient care. The science is at our fingertips.